

IN THE CLAIMS:

Please cancel claims 1, 3-12, and 14-18 without prejudice and amend the claims as follows:

1-18. (Canceled)

19. (Currently Amended) A method of forming a dual damascene structure, comprising:

- depositing a first dielectric film on a substrate;
- depositing an etch stop on the first dielectric film;
- pattern etching the etch stop to define a vertical interconnect opening and expose the first dielectric film;

- depositing a second dielectric film on the etch stop and the exposed first dielectric film;

- pattern etching the second dielectric film to define a horizontal interconnect and continuing to etch the exposed first dielectric film to define the vertical interconnect;

- depositing a barrier layer on the substrate;
- depositing a metal-containing layer on the substrate to fill both the vertical interconnect and the horizontal interconnect;

- planarizing the metal-containing layer and the second dielectric film;

- depositing a refractory metal nitride cap layer on the planarized metal-containing layer and the planarized second dielectric film by a cyclical deposition process comprising alternately pulsing a metal-containing compound and a nitrogen-containing compound to deposit the refractory metal nitride cap layer; and

- depositing an etch stop layer on the refractory metal nitride cap layer.

20. (Canceled)

21. (Previously Presented) The method of claim 19, wherein the refractory metal nitride cap layer comprises tantalum nitride.

22. (Previously Presented) The method of claim 19, wherein the pulsing is continued until the refractory metal nitride cap layer has a crystalline like structure over the metal-containing layer.
23. (Previously Presented) The method of claim 19, wherein the pulsing is repeated until the refractory metal nitride cap layer has a thickness of from about 5 angstroms to about 20 angstroms.
24. (Previously Presented) The method of claim 19, further comprising flowing a non-reactive gas continuously during the pulsing of the metal-containing compound and the pulsing of the nitrogen-containing compound.
25. (Previously Presented) The method of claim 19, wherein the pulsing of the metal-containing compound and the pulsing of nitrogen-containing compound are separated by a time delay.
26. (Previously Presented) The method of claim 19, wherein the refractory metal nitride cap layer has a thickness sufficient to block diffusion of metal atoms from the metal-containing layer.